Indicators for Large Rivers

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Survey of the Nation's Rivers
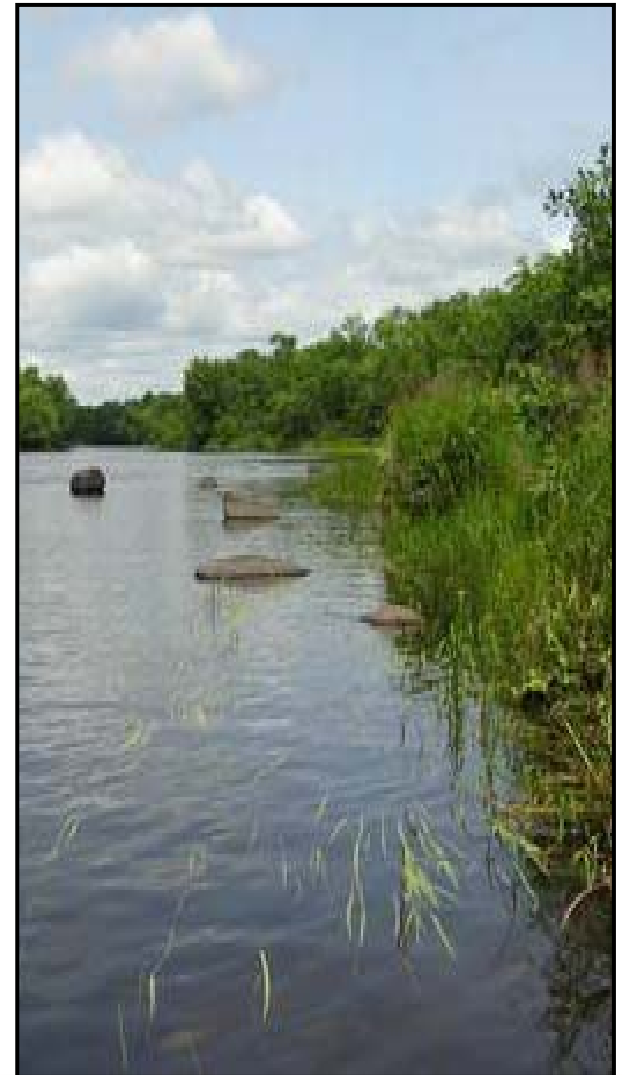*Planning Meeting*
January 10-12, 2007, San Antonio, TX

RESEARCH & DEVELOPMENT

Building a scientific foundation for sound environmental decisions

Indicators Workgroup

- Gretchin Hayslip (Region 10, Lead)
- Tom Faber (Region 1)
- Larry Merrill (Region 3)
- Lou Reynolds (Region 3)
- Ed Hammer (Region 5)
- Larry Shepard (Region 7)
- Tina Laidlaw (Region 8)
- Lillian Herger (Region 10)
- Joe Flotemersch (ORD-Cincinnati)
- Brian Hill (ORD-Duluth)
- Evan Hornig (OW, OST)

Objectives of the Non-Wadeable Rivers Survey

1. Conduct a statistically valid assessment of the ecological condition of National Rivers

2. Build capacity

Objectives of Indicators Session

- Review "Core" and "Potential" indicators

- Facilitate open discussion on pros and cons of each

- Identify a candidate list of "best fits" indicators

- Discuss and document methodological variables that will require additional discussion

Core and Potential Indicators

- Core: All National Surveys
  - Physical Habitat
  - Water Chemistry
  - Benthic Macroinvertebrates

- Core: Rivers (Proposed)
  - Physicochemical
  - Benthic Macs
  - Fish
  - A human health/recreation indicator(s)

- Potential additional indicators
  Metals, fish tissue, algae (peri/phyto), remote sensing, others

Reminder…
Targeting at least two bioindicators

Desirable Indicator Traits

- **Sampleable in a single day visit**

- **Sampleable at all sites**

- **Present in sufficient numbers to yield a useful sample (condition dependent)**

- **Contributes to the condition assessment**

- **Has diagnostic capabilities**

- **Useful across a wide range of conditions**

Desirable Indicator Traits

- **Sample effort required $\propto$ Data value**

- **Subjectivity of the method minimized across crews and sites**

- **Signal : Noise**
  - **Data variability most associated with changes in condition rather than:**
    - **Sample time**
    - **Crew**
    - **Exact sample point**

Methods...


Bob Hughes

Methods Associated with Indicators

- **Use methods where we have documented the comparability with other methods**

- Ideally, we know the performance characteristics of the methods utilized.
  - Precision
  - Bias
  - Representativeness
  - Responsiveness

Finding a Balance

The indicators we select will influence the number of sites that can be sampled

- Field cost
- Laboratory cost

Extensive

Intensive
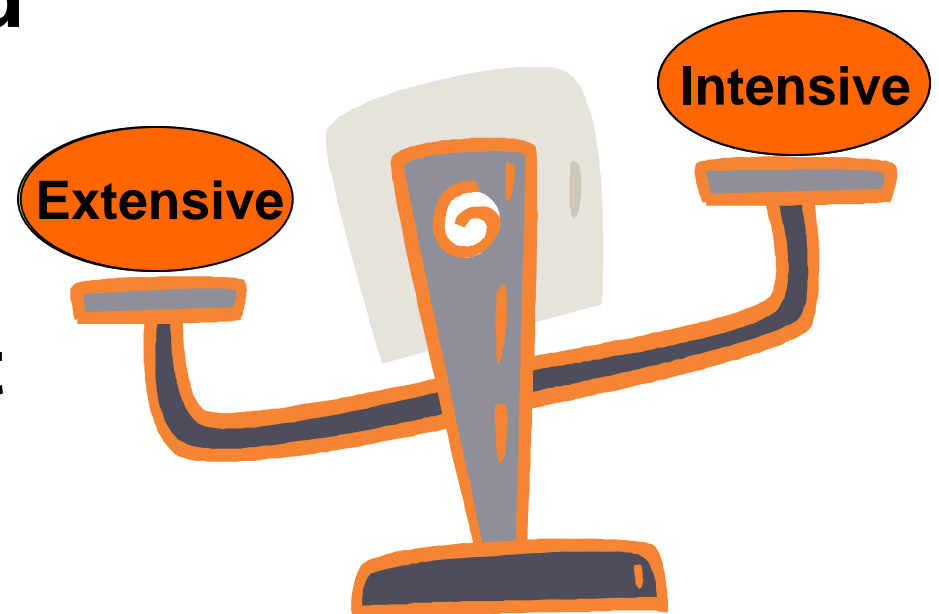
- Note: The following two slides represent summary comments presented at the conclusion of the meeting after group discussions.

-Summary-

- Indicators of interest to workgroup
  - Water Chemistry
  - Physical Habitat
  - Bioindicators – give different messages
    - Fish
      - Also interested in some sort of fish tissue sample
    - Benthic Macroinvertebrates
      - Explore flexibility in the method
    - Algae
  - Recreational Indicator

-Next Steps

- Form workgroup
  - If interested in participating in the workgroup, contact Treda Smith

    smith.treda@epa.gov
    202-566-0916

- Formulate cost estimates
- Develop criteria for including or excluding
- Draft indicators w/protocols